EDINBURGH JOURNAL OF BOTANY 66 (1): 27–49 (2009)

doi:10.1017/S0960428609005174

A REVISION OF THE AFRICAN GENERA *PAROPSIOPSIS* AND *SMEATHMANNIA* (*PASSIFLORACEAE – PAROPSIEAE*), INCLUDING A NEW SPECIES OF *PAROPSIOPSIS* FROM CAMEROON

J. M. DE VOS[1,2] & F. J. BRETELER[1,3]

The African genera *Paropsiopsis* Engl. and *Smeathmannia* R.Br. (*Passifloraceae – Paropsieae*) are revised. The two genera are well separated based on the presence or absence of a second, annuliform, corona, as well as the number of stamens and curvature of their filaments. An overview of important characters and a key to all genera of *Paropsieae* is provided. In *Paropsiopsis* all previously recognised species are united under *P. decandra* (Baill.) Sleumer. In addition one species, *Paropsiopsis atrichogyna* J.M.de Vos & Breteler, is newly described and illustrated. In *Smeathmannia* both previously recognised species are maintained, but infraspecific taxa are rejected. Descriptions of both genera and their species, keys to species, illustrations and distribution maps are provided.

Keywords. Africa, new species, *Paropsieae*, *Paropsiopsis*, *Passifloraceae*, *Smeathmannia*, taxonomic revision.

INTRODUCTION

The tribe *Paropsieae* (*Passifloraceae*) consists of 22 species in six genera, 21 of which are confined to Africa. One species of *Paropsia* Noronha ex Thouars occurs in SE Asia (i.e. *P. vareciformis* (Griff.) Mast.). The group consists of trees, treelets and shrubs lacking the tendrils and climbing habit that is characteristic of other *Passifloraceae*. Within *Paropsieae*, the genus *Barteria* Hook.f. has been revised by Breteler (1999) and *Paropsia* by Sleumer (1970). The genera *Androsiphonia* Stapf and *Viridivia* J.H.Hemsl. & Verdc. are monotypic and morphologically amply characterised. Identification of species within *Paropsiopsis* Engl., as well as delimitation of the genus against *Smeathmannia* R.Br., has been problematic and provided the spur for the current treatment. This study clarifies limits between all genera of *Paropsieae* and provides a taxonomic revision of the genera *Paropsiopsis* and *Smeathmannia*.

[1] Herbarium Vadense, Biosystematics Group, Wageningen University, Foulkesweg 37, 6703 BL Wageningen, The Netherlands.
[2] Present address: Institute for Systematic Botany, University of Zürich, Zollikerstrasse 107, 8008 Zürich, Switzerland. E-mail: Jurriaan.deVos@systbot.uzh.ch
[3] E-mail: Frans@Breteler.demon.nl

It is based on the study of herbarium specimens and alcohol collections from the herbaria BM, BR, C, COI, K, LBV, LISC, MO, P, WAG and Z.

Systematic Position

Previously, some authors placed the tribe *Paropsieae* in the former *Flacourtiaceae* (e.g. Pellegrin, 1952; Sleumer & Bamps, 1976) while others accommodated it in *Passifloraceae* (Keay, 1954; Sleumer, 1970; de Wilde, 1971). Molecular studies (e.g. Chase *et al.*, 2002) suggest an evolutionary affinity with *Passifloraceae*, *Turneraceae* and *Malesherbiaceae* (*Malpighiales*), rather than an affinity with *Salicaceae* or *Achariaceae* (in which most of the former *Flacourtiaceae* is now placed; Chase *et al.*, 2002). Bernard (1999) found support for a strong affinity of the tribe with *Passifloraceae*, based on floral (micro-)morphology and development. Presting (1965) and Keating (1973) concluded the same based on pollen morphology. Therefore, the tribe is here considered part of *Passifloraceae*.

History

Paropsiopsis was described in 1892 with *P. africana* Engl. from Gabon as the type species (Engler, 1892). It was regarded as similar to *Paropsia*, differing in having a double corona and more stamens. Baillon (1882) had already described a species confusingly referred to as '*S. decandra*' (see below), and erected the section *Diploparopsia* in *Paropsia* to accommodate it. Gilg (1908) suggested that the material mentioned by Baillon (1882) belonged to *Paropsiopsis* but did not make the combination. Gilg (1908) also described five additional species based on only seven collections from Cameroon and Gabon. Based on material later collected in Cabinda, Angola, Exell (1929) described *Paropsiopsis ferruginea*. Sleumer (1970), in his treatment of *Paropsia*, combined *Paropsiopsis africana* Engl. with the aforementioned *Smeathmannia decandra* Baill. to *Paropsiopsis decandra* (Baill.) Sleumer. The validity of this combination is discussed under *Paropsiopsis decandra*. Sleumer & Bamps (1976) later treated *Paropsieae* for the *Flora of Central Africa* in which they treat one species of *Paropsiopsis.* They state that the whole genus contains four closely related species, rather than the seven described at that time, but omitted which species should be recognised.

Brown (1821) described *Smeathmannia* in a footnote of an article otherwise concerning the description of the genus *Rafflesia* R.Br. He mentioned affinities with the genus *Paropsia*, which differs in having a smaller number of stamens. The genus is named after the Dane Henry Smeathman, who collected the genus in 1771 or 1772 whilst working in Sierra Leone (Hepper & Neate, 1971). Brown had previously mentioned the genus (Brown, 1818), with a different spelling, as *Smeathmania* (i.e. with one 'n'). That publication, however, is invalid because it provides only a character shared with another genus and therefore does not meet the requirements for a valid diagnosis under the International Code of Botanical

Nomenclature (McNeill *et al.*, 2006, Art. 32.2). Brown (1821) based the genus on material from Sierra Leone that he and Solander studied in the herbarium of Joseph Banks. Three species were described: *Smeathmannia pubescens* Sol. ex R.Br., *S. laevigata* Sol. ex R.Br. and *S. media* R.Br., the last intended as a 'varietas' of *S. laevigata* (Brown, 1821). Endlicher (1839) merged the monotypic genus *Buelowia* Schumach. & Thonn. with *Smeathmannia* and Lemaire (1851) described two additional species (*S. emarginata* and *S. rosea*). Masters (1871) noted in the *Flora of Tropical Africa* that leaves are variable in form and therefore merged *Smeathmannia media* with *S. pubescens*. However, he ignored the species described by Lemaire (1851). Baillon (1882) proposed that *Smeathmannia* should be a section of *Paropsia*. This was accepted until Gilg (1908) argued that *Smeathmannia* deserved recognition at the genus level but suggested that it contained only two species. Chevalier (1920) described two varieties, *Smeathmannia pubescens* var. *cordifolia* and *S. laevigata* var. *nigerica*, of which the first has not been recognised since the first edition of the *Flora of West Tropical Africa* (Hutchinson & Dalziel, 1927).

Taxonomic Treatment

Generic delimitation within Paropsieae

The most important morphological characters to distinguish all genera of *Paropsieae* are listed in Table 1. A key to the genera based on these and other characters is provided below. Although most of the characters are in the flowers, most fruiting specimens can also be determined with this key as stamens and styles are usually persistent in fruit. The delimiting characters of *Paropsiopsis* and *Smeathmannia* are illustrated (Fig. 1).

Key to the genera of Paropsieae

1a. Androgynophore present; styles (2–)3 or more; second corona present or not _____ 2

1b. Androgynophore absent; style 1; second corona present (Benin to Congo (Kinshasa) and to W Tanzania) _____ **Barteria**

2a. Stamens 5 _____ 3

2b. Stamens 7 or more _____ 4

3a. Stamens free or nearly so (Nigeria to Madagascar and SE Asia) _____ **Paropsia**

3b. Stamens united in a tube around the lower third of the ovary (W Africa) _____ **Androsiphonia**

4a. Gynophore absent or very poorly developed; petiole without two glands near leaf base (but glands present on leaf margin and on branches near petiole) (Upper and Lower Guinea) _____ 5

TABLE 1. Important morphological characters (in rows) to differentiate between the genera of *Paropsieae* (in columns). Number of species in each genus is indicated. +: structure present; –: structure absent. Compiled from selected literature and confirmed by observations on herbarium material

Character	*Androsiphonia* 1 sp.	*Barteria* 4 spp.	*Paropsia* 12 spp.	*Paropsiopsis* 2 spp.	*Smeathmannia* 2 spp.	*Viridivia* 1 sp.
Number of coronas	1	2	1	2	1	1
Androgynophore	+	–	+	+	+	+
Number of stamens	5, fused for c.10–25% of their length	c.30, fused for c.25–50% of their length	5, free or nearly so	7–11, free or nearly so	(16–)20–29, free or nearly so	10–16, free or nearly so
Gynophore	–	–	–	–	–	+
Number of styles	3	1	(2–)3(–5)	4–6(–7)	(3–)4–6	4–6
Distribution	Sierra Leone to Ghana	Benin to Congo (Kinshasa) and to W Tanzania	Nigeria to Madagascar and SE Asia	Cameroon to W Congo (Kinshasa)	The Gambia to Cameroon	Zambia, Tanzania and Congo (Kinshasa)
Selected literature	Hawthorne & Jongkind (2006)	Breteler (1999)	Breteler (2003); Sleumer (1970)	See current treatment	See current treatment	Hemsley & Verdcourt (1956)

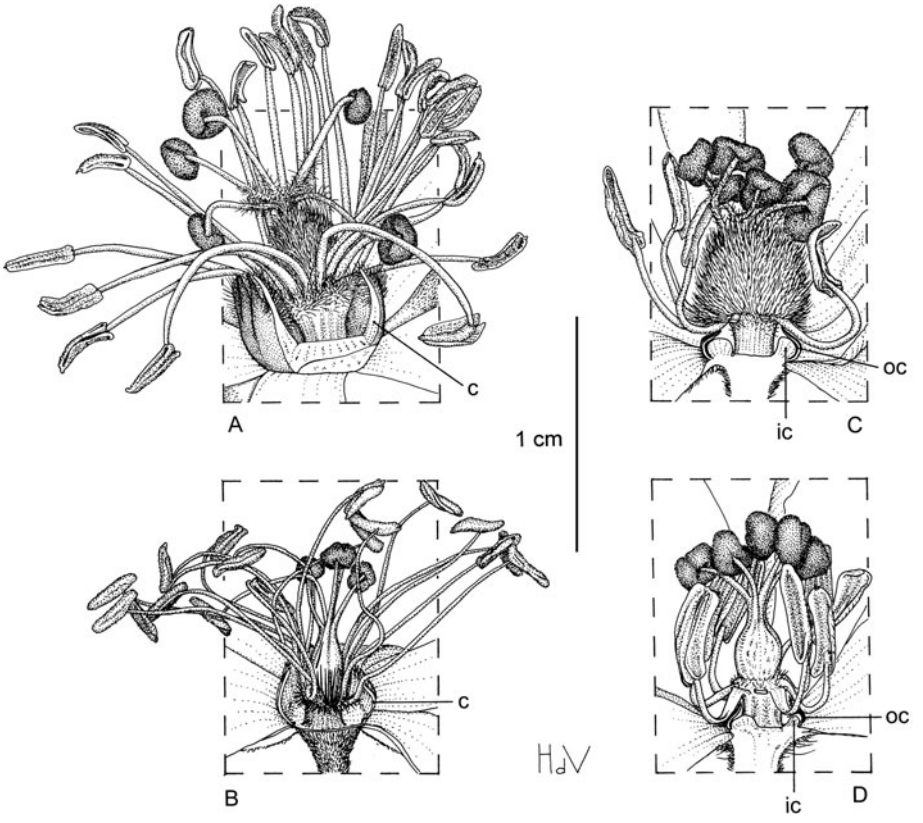

FIG. 1. A comparison of dissected flowers of *Smeathmannia* R.Br. and *Paropsiopsis* Engl., indicating the single corona of *Smeathmannia* (A, B; c: corona) and the double corona of *Paropsiopsis* (C, D; ic: inner corona; oc: outer corona): A, *Smeathmannia pubescens* Sol. ex R.Br. (spirit collection *W.J.J.O. de Wilde* s.n. (16 vii 1963), WAG); B, *Smeathmannia laevigata* Sol. ex R.Br. (*J.W.A. Jansen* 1596, WAG); C, *Paropsiopsis decandra* (Baill.) Sleumer (*Zenker* 413, WAG); D, *Paropsiopsis atrichogyna* J.M.de Vos & Breteler (holotype *T. van Andel et al.* 4220, WAG). Note that the filaments of *Paropsiopsis* (C, D) are at base ± perpendicular to the androgynophore and curve gradually upward, whereas the filaments of *Smeathmannia* (A, B) are straighter. Drawing by Hans de Vries.

4b. Gynophore present; petiole with two glands near leaf base (as well as on leaf margin and on branches near petiole) (Zambia, Tanzania and Congo (Kinshasa)) _____ **Viridivia**

5a. Annuliform second corona present inside outer corona; stamens 7–12; filaments at base ± perpendicular to androgynophore, gradually curving upward (Cameroon to W Congo (Kinshasa)) _____ **Paropsiopsis**

5b. Annuliform second corona absent; stamens (16–)20 or more; filaments not gradually curving upward (The Gambia to Cameroon) _____ **Smeathmannia**

Species delimitation within Paropsiopsis *and* Smeathmannia

In the current treatment all previously described species of *Paropsiopsis* are lumped into the type species *P. decandra* (Baill.) Sleumer. The five species described by Gilg (1908) were, in his opinion, distinguishable in leaf shape, flower size or size of the androgynophore. Exell (1929) added a species differing by its ferruginous hairs. However, these characters do not define discrete entities that deserve recognition as taxa because intermediate states are present in other collections. Moreover, we observed that the variation between duplicates of a single collection can be larger than the differences between two previously recognised species. Nevertheless, recent collections revealed a new species which appears to be endemic in the Campo Ma'an area of S Cameroon. It is named *Paropsiopsis atrichogyna*, after its glabrous pistil. The current treatment confirms specific differences in *Smeathmannia*, but infraspecific taxa are abandoned. These were based on variations in leaf shape, which is variable in *Smeathmannia*. Since the circumscription of these two species is unaltered, descriptions are provided in brief and focus on differentiating characters. Differences between these two and the two species of *Paropsiopsis* are illustrated (Fig. 1).

Notes on descriptions

In previous descriptions of species of *Paropsieae* the perianth was usually divided into calyx (sepals) and corolla (petals). In *Paropsiopsis*, however, the change from sepals to petals is gradual and some intermediate segments can, therefore, not be referred to as either sepal or petal. For instance, only segments exposed in bud have long hairs on the outside and differ slightly in colour from unexposed segments which are devoid of long hairs. Segments that are partly exposed in bud are partly hairy. Therefore, the current treatment uses the less specific term tepal. In *Smeathmannia* the difference between outer and inner tepals is more evident – there are two ± distinct whorls. For the sake of consistency, however, the term tepal is used throughout all descriptions. Whenever relevant, a distinction is made between outermost and innermost tepals.

Several authors considered *Paropsiopsis* to be stipulate (Gilg, 1908; Exell, 1929; Sleumer & Bamps, 1976). Gilg (1908) states in the protologue of *Paropsiopsis leucantha* that 2 stipules are present. Exell (1929), while describing *Paropsiopsis ferruginea*, gives a description of stipules. Sleumer & Bamps (1976) mention that stipules are early caducous. However, careful observations did not reveal stipules, nor scars, even on young branches. We conclude that true stipules are absent, but 1–3 glands in the stipule position are almost always present. The structures referred to by Gilg (1908) and Exell (1929) are most likely the (usually 4) persistent sessile floral bracts. Glands and floral bracts are illustrated (Fig. 2C–D).

Paropsiopsis Engl., Bot. Jahrb. Syst. 14: 391 (1892); Warb. in Engl. & Prantl, Nat. Pflanzenfam. 3(6a): 27 (1895); Gilg in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, 21:

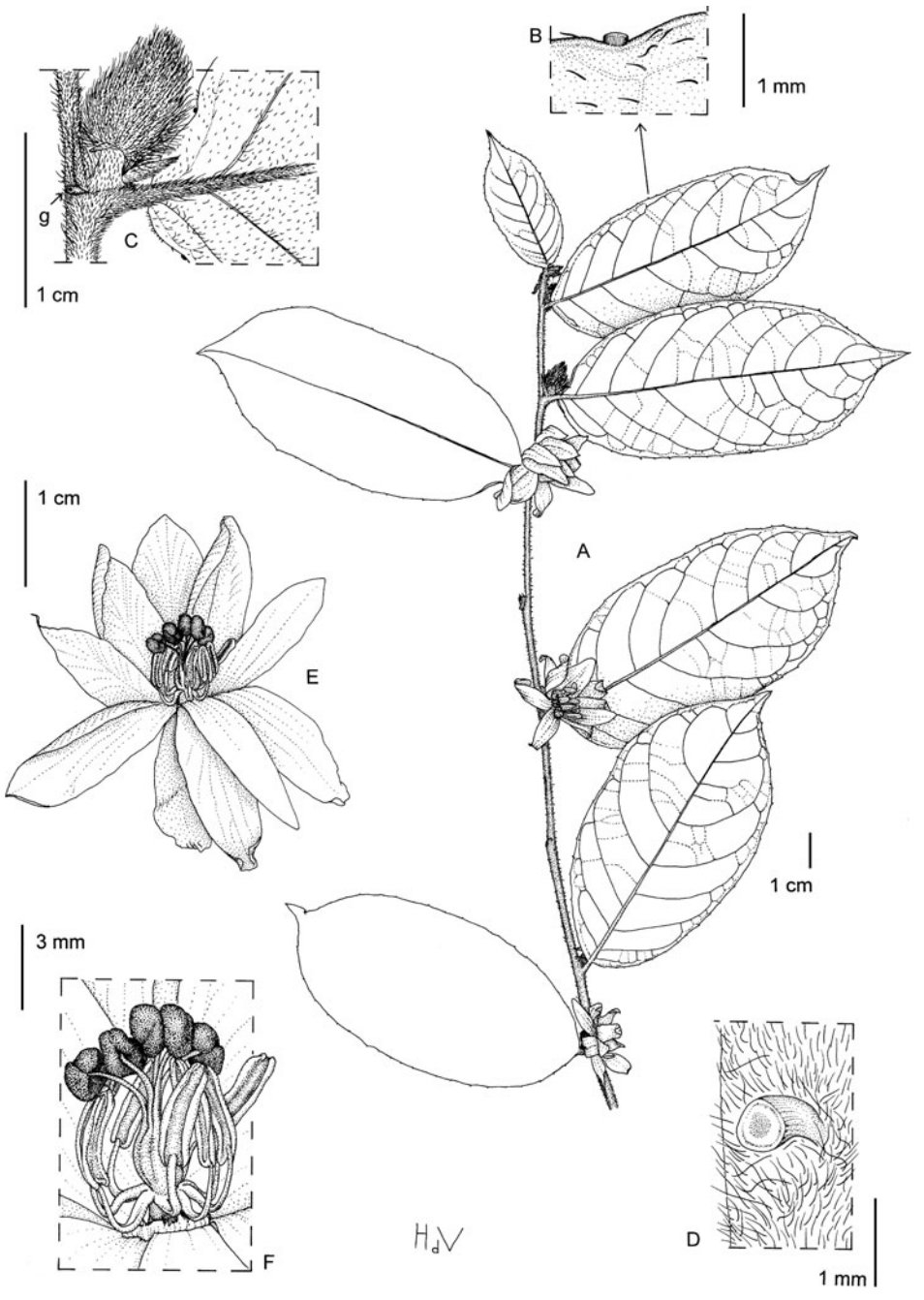

FIG. 2. *Paropsiopsis atrichogyna* J.M.de Vos & Breteler: A, flowering branch; B, gland on leaf margin; C, leaf axil with flower bud (g: gland near petiole base; also note the floral bracts supporting the bud); D, gland near petiole base, magnified from C; E, open flower; F, androgynoecium (A–F holotype *T. van Andel et al.* 4220, WAG). Drawing by Hans de Vries.

415 (1925); Pellegr., Bull. Soc. Bot. Fr., Mémoires 33: 115 (1952); Sleumer & Bamps, Fl. Afr. Centr., Flacourtiaceae 2: 32 (1976); Feuillet & J.M.MacDougal, Passifloraceae in Kubitzki, Fam. Gen. Vasc. Pl. 9: 279 (2007). – *Paropsia* sect. *Diploparopsia* Baill., Bull. Mens. Soc. Linn. Paris 1: 304 (1882); Warb. in Engl. & Prantl, Nat. Pflanzenfam. 3(6a): 27 (1895). – Type species: *Paropsiopsis africana* Engl. (= *Paropsiopsis decandra* (Baill.) Sleumer).

Small trees with spreading plagiotropic branches mostly from the top, rarely trees > 5 m, shrubs (or lianas?[1]); indumentum of simple hairs, rarely branched hairs present. *Leaves* alternate, shortly petiolate; lamina with glands along margin and at the apex; venation pinnate, camptodromous, prominent below, midrib slightly raised above. *Flowers* hermaphrodite, in leaf axils of plagiotropic branches, 1–2(–3) per axil, pedicellate or subsessile; floral bracts usually 4, persistent, apex acute with gland; tepals 8–12, imbricate, outermost tepals with small glands on the margin and apex, tepals persistent in fruit; extrastaminal corona double, outer one thin, 1–3 mm high, inner one annular, c.1 mm high and adnate to outer corona; androgynophore present; stamens 7–11, in one whorl, filaments broadening towards base and there adnate to one another and ± perpendicular to the androgynophore, gradually curving upward; anthers basifixed, oblong, c.3 mm long; ovary unilocular with (3–)4–6(–7) parietal placentae; styles (3–)4–6(–7), fused at base or free, stigmas subcapitate. *Fruits* subglobose to ovoid to obovoid, opening by slits in between the placentae, many-seeded. *Seeds* ovoid to ellipsoid, areolate.

Key to the species

1a. Ovary glabrous; base of the ovary smaller than the top of the androgynophore, filaments therefore not adnate to ovary; longest hairs on the midrib beneath generally subappressed, never densely pubescent (S Cameroon) _____ **1. P. atrichogyna**

1b. Ovary tomentose to villose; base of the ovary as large as the top of the androgynophore, filaments therefore adnate to ovary or nearly so; longest hairs on the lamina midrib beneath generally erect, rarely only recurved hairs of ≤ 0.5 mm present, if all hairs subappressed on young leaves, then these densely pubescent (Cameroon to W Congo (Kinshasa)) _____ **2. P. decandra**

1. Paropsiopsis atrichogyna J.M.de Vos & Breteler, **sp. nov. Figs 1D, 2, 3.**
Paropsiopsis atrichogyna a *Paropsiopse decandra* (Baill.) Sleumer gynoecio glabro, basi ovarii apice androgynophori minore, staminibus 7 ad 9, pilis longioribus in costa folii faciei inferioris maximam partem adpressis vel subadpressis differt. – Type: Cameroon, South Province, Campo Ma'an area, Boussebeliga creek, 2°43′N, 9°52′E, in disturbed primary forest with *Sacoglottis gabonensis*, 40 m, 26 x 2001, *T. van Andel et al.* 4220 (holo WAG!; iso SCA, U, YA?).

[1] This habit has only twice been mentioned on herbarium labels and we doubt its authenticity.

Treelet 4 m high with bole of 1 cm wide and umbrella-shaped crown. *Branches* with 0–2 glands near petiole base, glands stalked or not; branches, petiole, pedicel and exposed parts of perianth sparsely hispid with 1.5–2 mm long straight hairs, subappressed or not, intermixed with c.0.2 mm long appressed or recurved hairs. *Petiole* decurrent onto the branches, semi-terete to terete, 2–6 mm long. *Leaf blade* elliptic to narrowly elliptic or slightly obovate, 2–3 times as long as wide, 7.6–14 × 3.2–5.4 cm, rounded at base, acuminate to rarely acute at apex, acumen acute, 3–13(–17) mm long; leaf margin nearly entire to very shallowly dentate to serrate; midrib above with hairs appressed or subappressed towards leaf apex, beneath with 1–2 mm long hairs which are mostly appressed or subappressed and with c.0.2 mm long, scattered, recurved hairs, extending onto the 6–10(–11) pairs of lateral nerves. *Flowers* solitary. *Floral bracts* triangular to broadly ovate, 3–4 mm long, outside hairy with appressed straight hairs, nearly glabrous inside. *Pedicel* terete, 1–4 mm long. *Tepals* 8–11, minutely tomentose with hairs ≤ 0.3 mm, ovate (outermost tepals) to elliptic to oblong (innermost tepals), 12–20 × 4–8 mm, whitish green to creamy white (outermost tepals) or yellow to creamy white (innermost tepals). *Outer corona* glabrous, 1–1.8 mm high, upper third irregularly fringed. *Inner corona* glabrous, c.0.7 mm high. *Androgynophore* terete, slightly enlarged towards base and apex, c.1 mm in diameter, c.2 mm long. *Stamens* 7–9, glabrous; filaments c.3 mm long. *Pistil* 4.5–7 mm long, glabrous. *Ovary* subglobose, 1.8–2.2 mm in diameter; base of ovary smaller than top of the androgynophore, sparsely tomentose around base of the ovary. *Styles* 4–5, 3–4.5 mm long, shortly united at base; stigmas 1.8–2.5 mm in diameter. *Fruits* unknown.

Distribution and ecology. In the Campo Ma'an area in S Cameroon, in disturbed primary, evergreen forest, not far from the Atlantic coast (Fig. 3).

Uses. The label of the holotype mentions 'crushed leaves mixed with black palm oil are rubbed on the body against fever with trembling; some is drunk as well'.

Etymology. The species is named after its glabrous pistil, the character by which it is distinct from *Paropsiopsis decandra*.

Additional specimen examined. CAMEROON. South Province, c.2 km N of the village of Ebodjé, in understorey of mature, but selectively logged, evergreen forest, 2°34′N, 9°50′E, 5 iv 2002, *D.B. McKey* 2002/1 (WAG!).

At present, fruits are unknown for *Paropsiopsis atrichogyna*. These are, however, expected to be glabrous given that in the three other species in this study the indumentum of the ovary is persistent in fruit and *Paropsiopsis atrichogyna* has a glabrous ovary. Therefore, it is expected that the glabrous fruits of *Paropsiopsis atrichogyna* can be distinguished from the pubescent fruits of *P. decandra*.

2. Paropsiopsis decandra (Baill.) Sleumer, Bull. Jard. Bot. Natl. Belg. 40: 74 (1970). – *Smeathmannia decandra* Baill., Bull. Mens. Soc. Linn. Paris 1: 304 (1882). – *Paropsia*

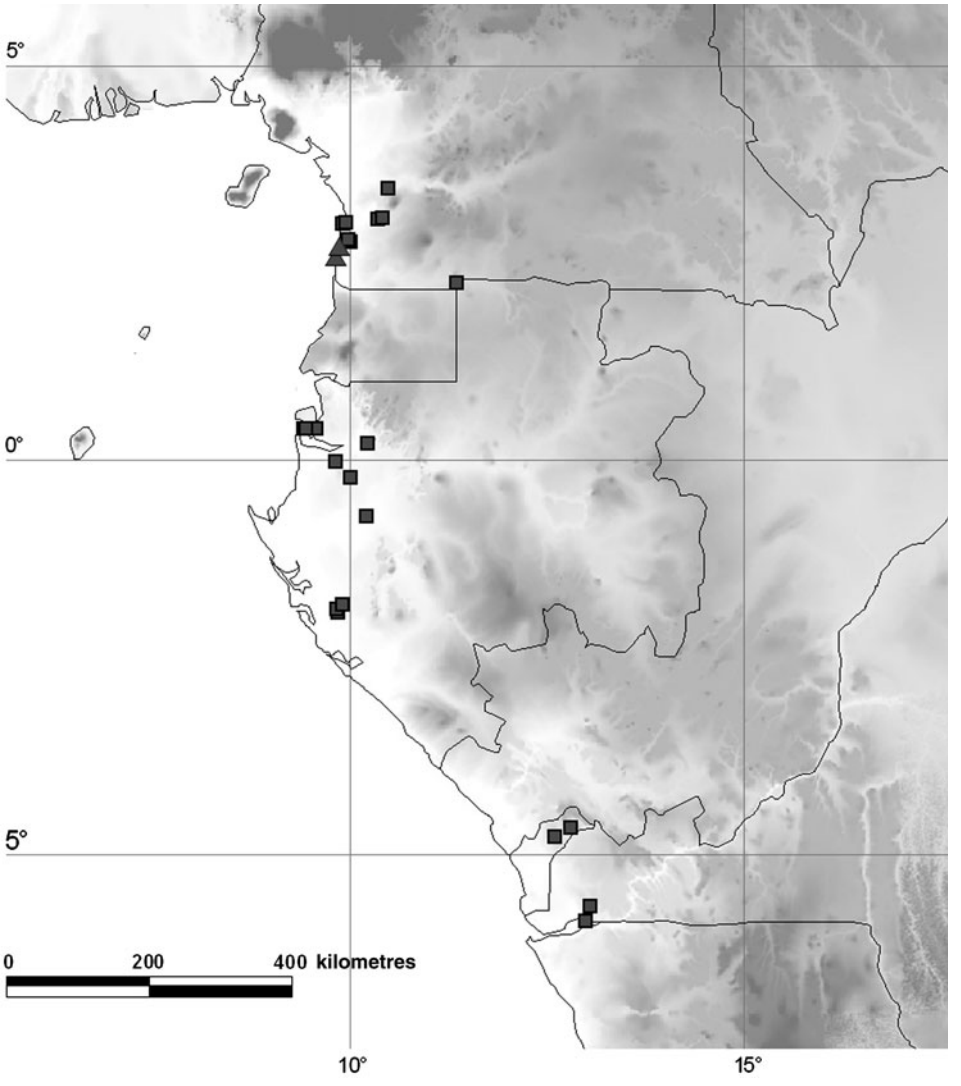

FIG. 3. Distribution map of *Paropsiopsis decandra* (Baill.) Sleumer (squares) and *Paropsiopsis atrichogyna* J.M.de Vos & Breteler (triangles).

decandra Gilg in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, 21: 415 (1925), nom. illeg. – Type: Gabon, *Duparquet* s.n. (holo P!). **Figs 1C, 3.**

Paropsiopsis africana Engl., Bot. Jahrb. Syst. 14: 392 (1892). – Type: Gabon, Munda, 'im Wald am Maweli, bei der Sibange-Farm', 6 i 1882, *H. Soyaux* 366 (holo B†; lecto Z!, designated here, see notes; isolecto K (scan seen), Z!).

Paropsiopsis leucantha Gilg, Bot. Jahrb. Syst. 40: 475 (1908). – *Paropsiopsis africana* var. *leucantha* (Gilg) Pellegr., Bull. Soc. Bot. Fr., Mémoires 33: 115 (1952). – Type:

Cameroon, South Province, 'in den Urwaldbergen zwischen Kribi und Bipinde', vi 1902, *Zenker* 2434 (holo B†; lecto BR!, designated here, see notes; isolecto BM!, K (scan seen), L (scan seen), Z (scan seen)), **syn. nov.**

Paropsiopsis jollyana Gilg, Bot. Jahrb. Syst. 40: 475 (1908). – Type: Gabon, Estuaire, Libreville, v? 1891, *Jolly* 15 (holo P!), **syn. nov.**

Paropsiopsis zenkeri Gilg, Bot. Jahrb. Syst. 40: 476 (1908). – Type: Cameroon, South Province, 'im Bijoka-Urwald bei den Fällen des Lokundje', v 1898, *Zenker* 2043 (holo B†; lecto K (scan seen), designated here, see notes; isolecto BM!), **syn. nov.**

Paropsiopsis bipindensis Gilg, Bot. Jahrb. Syst. 40: 477 (1908). – Type: Cameroon, South Province, 'bei Nkuambe im Urwald', vi 1907, *Zenker* 3300 (holo B†; lecto BR!, designated here, see notes; isolecto BM!, K (scan seen), L (scan seen), MO!, P!), **syn. nov.**

Paropsiopsis pulchra Gilg, Bot. Jahrb. Syst. 40: 477 (1908). – Type: Cameroon, South Province, 'bei Bipinde-hof', iii 1904, *Zenker* 2908 (holo B†; lecto WAG!, designated here, see notes; isolecto BM!, BR!, K (scan seen), L (scan seen), P!), **syn. nov.**

Paropsiopsis ferruginea Exell, J. Bot. 67 suppl. 1: 191 (1929); Gossw. & Mendonça, Cart. Fitogeogr. Angol. 56 (1939); Sleumer & Bamps, Fl. Afr. Centr., Flacourtiaceae 2: 33 (1976). – Type: Angola, Cabinda, Hombe region, Rio Lufo, Caio, Mayumbe, sporadic in shady humid situations amongst new thickets on abandoned native plantation-grounds, i 1919, *Gossweiler* 7693 (holo BM!; iso COI!, K (scan seen), LISC!), **syn. nov.**

Treelet 3–6 m high, bole c.4(–10) cm dbh, rarely a shrub, tree to 15 m (or liana? – see footnote above). *Branches* with 1–3 usually stalked, 1–2.5 mm long glands on each side of petiole base; branches hispid to densely hispid with 1.5–2 mm long straight erect hairs, these rarely branched, or rarely with only c.0.5 mm long appressed or recurved hairs, usually a combination of both types, indumentum extending onto pedicel, petiole and midrib of lower leaf surface. *Petiole* decurrent onto the branches, semi-terete to terete, 1–7 mm long. *Leaf blade* ovate to elliptic or narrowly ovate to narrowly elliptic, 2–3.5(–4) times as long as wide, 4–26 × 2.5–6.5(–8.5) cm, rounded or cuneate at base, acuminate to rarely acute at apex, acumen acute, (2–)5–30 mm long, upper surface nearly glabrous to puberulous, lower surface densely to sparsely hispid, denser on main and secondary nerves, hairs erect to rarely subappressed; leaf margin entire to dentate to serrate, usually shallowly so; midrib above glabrous to hispid, hairs erect to subappressed towards leaf apex; lateral nerves 7–12(–15) pairs, rarely sunken in upper surface. *Flowers* 1–2(–3) per axil. *Floral bracts* broadly to narrowly triangular, 3–9 mm long, outside hairy with appressed straight hairs or partly so, sparsely so to nearly glabrous inside. *Pedicel* terete, 3–11 mm long. *Tepals* 8–12, minutely tomentose with hairs ≤ 0.3 mm, ovate to narrowly ovate (outermost tepals) or elliptic to narrowly elliptic (innermost tepals), 15–29 × 5–12 mm, pale green to creamy white (outermost tepals) or pale ochre-coloured to pale orange-red to white (innermost tepals). *Outer corona* glabrous to sparsely ciliate, 2–3 mm high,

upper half to upper quarter irregularly fringed. *Inner corona* glabrous, 0.5–1 mm high. *Androgynophore* terete, slightly enlarged towards base and apex, c.1 mm in diameter, c.2 mm long, at top sparsely tomentose or glabrous. *Stamens* 8–11, usually tomentose at base; filaments 3–4 mm long. *Pistil* (5–)6.5–9 mm long, (densely) tomentose to villose. *Ovary* subglobose to ellipsoid, 3–4 mm long, 2–3 mm in diameter. *Styles* (3–)4–6(–7), 2.5–5 mm long, united at base for up to 2 mm, pubescent or glabrous; stigmas 1.2–2.5 mm in diameter. *Fruit* subglobose to ovoid to obovoid, 1.8–2.5 cm long, 1.2–2.5 cm in diameter, densely to sparsely tomentose. *Seed* 4–5(–7) × 2–3(–4) × 1–2 mm, yellowish brown in sicco.

Distribution and ecology. From S Cameroon to W Congo (Kinshasa). It is likely that this species also occurs in Equatorial Guinea (Fig. 3). Found in primary or secondary lowland rainforest, also along roadside; rarely in fairly dry littoral forest, but well away from the shore; up to 300 m altitude.

Selected specimens examined. Angola. **Cabinda**: Hombe region, Mayumbe, Belize, 4°39′S, 12°48′E, 1 iii 1917, *J. Gossweiler* 7011 (BM).

Cameroon. **Central Province**: 40 km S of Badjob, 50 km SW of Eséka, near the Nyong river, 3°28′N, 10°30′E, 18 xii 1963, *W.J.J.O. de Wilde & B.E.E. de Wilde-Duyfjes* 1527 (BR, K, P, WAG). **South Province**: 8 km from Kribi, Edea road, sec. forest edge, shade, roadside, 3°00′N, 9°56′E, 24 xii 1968, *J.J. Bos* 3499 (WAG); 15 km N of Kribi, fairly dry littoral forest, slightly sec., well away from seashore, 3°01′N, 9°58′E, 4 ii 1969, *J.J. Bos* 3853 (WAG); E crest of Mt Elephant, SE of Kribi, 2°47′N, 10°00′E, 200–300 m, 4 xii 1969, *J.J. Bos* 5770 (BR, C, K, LISC, MO, P, WAG, YA, Z); Summit of Mt Elephant, SE of Kribi, 2°47′N, 10°01′E, 300 m, 14 i 1970, *J.J. Bos* 6135 (P, WAG); Summit of Mt Elephant, high forest, SE of Kribi, 2°48′N, 10°00′E, 300 m, 13 iii 1970, *J.J. Bos* 6556 (WAG); Bipinde, 3°05′N, 10°25′E, vi 1913, *G.A. Zenker* 412 (C, COI, MO, WAG); Bipinde, Als unterholz am wege nach Songlepem, 3°05′N, 10°25′E, 1904, *G.A. Zenker* 3128 (BM); Bipinde, 3°05′N, 10°25′E, 1908, *G.A. Zenker* 3614 (BM, MO); Mimfia, 3°04′N, 10°23′E, iii 1913, *G.A. Zenker* 262 (C, COI, WAG); Bipinde, 3°05′N, 10°25′E, ix 1913, *G.A. Zenker* 413 (C, COI, MO, WAG); Ngoasik (10 km SSE Ambam), dans les cacaoyères pres du village, 2°15′N, 11°22′E, 1 iii 1963, *J. Raynal & A. Raynal* 10134 (YA); Bipinde, 3°05′N, 10°25′E, 1913, *G.A. Zenker* 4790 (MO); Bipinde, 3°05′N, 10°25′E, 1913, *G.A. Zenker* 4721 (COI, MO).

Congo (Kinshasa). **Bas-Congo**: Around Luki, 5°38′S, 13°04′E, 22 x 1958, *J. Hombert* 485 (BR, MO, WAG); 5°50′S, 13°00′E, 1947, *A. Flamigni* 10079 (BR).

Gabon. **Estuaire**: Angoni, 70 miles E of Gaboon, 0°13′N, 10°14′E, 28 x 1897, *G.L. Bates* 560 (BM, P, Z); Env. de Libreville, 0°25′N, 9°27′E, 26 ix 1901, *T.-J. Klaine* 2409 (P, WAG); S of Estuaire du Gabon along Remboué River, British Gas oil exploration site, 0°00′N, 9°50′E, 10 m, 25 x 1991, *G.D. McPherson* 15458 (LBV, MO, WAG); South of Estuaire du Gabon along Remboué River, British Gas site, 0°12′S, 10°01′E, 10 m, 4 i 1991, *G.D. McPherson* 15069 (LBV, MO, WAG); Remboué I, sur ligne 01, 0°12′S, 10°01′E, 21 i 1991, *A.M. Louis & A. Moungazi* 3302 (BR, LBV, MO, WAG); Libreville, 0°25′N, 9°27′E, 1896, *T.-J. Klaine* 389 (BM, BR, P, WAG); environs de Libreville, 0°25′N, 9°27′E, 26 xi 1898, *T.-J. Klaine* 194a (P, WAG); 18 km Est de Libreville, 0°24′N, 9°35′E, x 1961, *G. de Saint Aubin* SRFG2074 (P). **Moyen-Ogooué**: Lambaréné sur l'Ogooué, 0°42′S, 10°13′E, 18 vii 1912, *A.J.B. Chevalier* 26119 (P). **Ogooué-Maritime**: Rabi-Kounga, about 4 km from Divangui, in forest, 1°55′S, 9°52′E, 24 xi 1991, *J. Schoenmaker* 203 (LBV, WAG); Rabi-Kounga, near Rabi 10, 1°54′S, 9°51′E, 25 xi 1991, *J. Schoenmaker* 210 (WAG); c.20 km NE of Rabi, 1°50′S, 9°55′E, 25 m, 24 xi 1989, *J.J.F.E. de Wilde et al.* 9697 (WAG).

All previously described species have been united here under *Paropsiopsis decandra* for reasons discussed above. The indumentum of the branches, pedicel, petiole and midrib of the lower leaf surface may consist of two types of hairs: a longer erect type of up to 3 mm and a short recurved or appressed type. The amount of both types is variable; most collections show a combination of both types. Collections in which the longer type of hairs is present can be distinguished vegetatively from *Paropsiopsis atrichogyna*, as that species usually has subappressed hairs of similar length on the midrib of the lower leaf surface (Fig. 2C). Several synonyms were based on *Zenker* collections, and one on a *Soyaux* collection. The holotypes of these were located in B during World War II and destroyed there. Lectotypes have to be chosen for these names and their selection is explained here. *Paropsiopsis africana* Engl. was based on the collection *Soyaux* 366 of which two sheets were traced in Z, and one in K. One of the specimens in Z is chosen as the lectotype as it contains the most developed flowers. *Paropsiopsis leucantha* Gilg was based on *Zenker* 2434; the BR isotype was chosen as the lectotype because it is the only one that contains developed flowers. For *Paropsiopsis bipindensis* Gilg, based on *Zenker* 3300, the BR material was chosen as the lectotype because it contains ample developed flowers and displays the largest variation in leaf size. *Paropsiopsis pulchra* Gilg was based on *Zenker* 2908, and the WAG isotype was chosen as the lectotype because it represents comparatively complete material having several developed flowers, flower buds and leaves. *Paropsiopsis zenkeri* Gilg was described based on two syntypes: *Zenker* 2043 (flowering) and *Zenker* 3128 (fruiting). Here, a flowering collection is preferred to function as lectotype because it most clearly displays the characters distinguishing the species from *Paropsiopsis atrichogyna*. The K duplicate of the collection *Zenker* 2043 is, therefore, chosen as the lectotype because it is the only sheet studied with an open flower.

The holotype of *Paropsiopsis decandra* in P is of very poor quality as it consists only of one incomplete leaf, a few seeds and two incomplete flowers. However, it can be identified without doubt, as it displays the characteristic curvature of the stamens and a pubescent ovary.

The publication of the name *Smeathmannia decandra* by Baillon (1882) is confusing, but its validity is nevertheless confirmed. Baillon (1882) refers to the species as '*S. decandra*', in a short paper on *Paropsia* and *Smeathmannia*, and gives a description and cites a collection (*Duparquet* s.n. (P!)). Subsequently he says that he is hesitant to confirm its status and expresses the opinion that he thinks the genus *Smeathmannia* (in which he just described the species) is no longer a good genus. He makes *Smeathmannia* a section of *Paropsia*, in which he also proposes two other sections: *Euparopsia* and *Diploparopsia*. However, based on Baillon's description of what he refers to as '*S. decandra*', it should not be placed in section *Smeathmannia* but in section *Diploparopsia*! According to the International Code of Botanical Nomenclature (McNeill *et al.*, 2006), expressing taxonomic doubt is no cause for invalidity of a publication (Art. 32.1). The fact that Baillon contradicts himself in referring to the new species as *Smeathmannia decandra* (rather than *Paropsia decandra*) does not invalidate the publication. In the Code, no comments are made about describing a species in a genus that is no longer

accepted. Therefore, it cannot be a cause for invalidating the publication of *Smeathmannia decandra* Baill. The recombination of *Smeathmannia decandra* Baill. to *Paropsiopsis decandra* (Baill.) Sleumer is thus also valid.

Smeathmannia R.Br., Trans. Linn. Soc. London 13: 220 (1821); DC., Prodr. 3: 322 (1828); Meisn., Gen.: tabl. diagn. 124, comm. 89 (1838); Endl., Gen. Pl. 925 (1839); Walp., Repert. Bot. Syst. 2: 218 (1843); ibid. 5: 770 (1846); Hook., Niger Fl. 364 (1849); Benth. & Hook.f., Gen. Plant. 1: 812 (1865); Mast. in Oliv., Fl. Trop. Afr. 2(2): 506 (1871); Gilg, Bot. Jahrb. Syst. 40: 474 (1908); Gilg in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, 21: 415 (1925); Hutch. & Dalziel, Fl. W. Trop. Afr. ed. 1, 1(1): 171 (1927); Keay in Hutch. & Dalziel, Fl. W. Trop. Afr. ed. 2, 1(1): 200 (1954); Nyananyo, Feddes Repert. 99: 98 (1988); Hawthorne & Jongkind, Woody Pl. W. Afr. Forests 200 (2006); Feuillet & J.M.MacDougal in Kubitzki, Passifloraceae, Fam. Gen. Vasc. Pl. 9: 279 (2007). – *Paropsia* sect. *Smeathmannia* (R.Br.) Baill., Bull. Mens. Soc. Linn. Paris 1: 304 (1882); Warb. in Engl. & Prantl, Nat. Pflanzenfam. 3(6a): 27 (1895). – Type species: *Smeathmannia pubescens* Sol. ex R.Br.

Buelowia Schumach. & Thonn., Beskr. Guin. Pl. 246 (1827). – Type species: *Buelowia illustris* Schumach. & Thonn.

Shrubs or treelets usually attaining 6 m in height, rarely trees with bole to 30 cm diameter. *Branches* with glands near petiole base. *Leaves* bearing 1–2(–3) flowers in leaf axils, shortly petiolate or subsessile, elliptic or obovate or round, less often ovate; leaf margin entire to serrate to dentate, with glands on the apices of teeth and on leaf apex. *Flowers* hermaphrodite, pedicellate, usually with 2 persistent bracts (sometimes 4 in *Smeathmannia laevigata*). *Tepals* c.10, in two, ± distinct whorls, persistent in fruit; the outer whorl with broader base, exposed parts outside tomentose to velutinous; inner whorl with smaller base. *Corona* single, fringed. *Androgynophore* present. *Stamens* (16–)20–29, in one whorl, tomentose to velutinous or glabrous at base. *Ovary* with (3–)4–6(–7) parietal placentae and equal number of styles; stigmas capitate. *Fruit* subglobose to ellipsoid, many-seeded, white to yellow to reddish. *Seeds* ellipsoid to obovate, areolate.

Key to the species

1a. Ovary glabrous or sparsely pubescent only on lower half; corona ± glabrous; fruits 1.5–2 times longer than the perianth; glands near petiole base sessile or nearly so (gland ± as high as wide); flowering and fruiting usually on lower side of branches; leaf blade usually decurrent along petiole; exposed parts of outer tepals often golden green and inner tepals often light reddish in sicco (The Gambia to Côte d'Ivoire) _____ **1. S. laevigata**

1b. Ovary densely pubescent; corona ciliate; fruit as long as the perianth or slightly smaller; glands near petiole base usually stalked (gland ≥ 2 times higher than wide); flowering and fruiting usually on upper side of branches; leaf blade not

decurrent along petiole; exposed parts of outer tepals often rather dark brown and inner tepals often medium orange-brown in sicco (Guinea-Bissau to Cameroon) _____ **2. S. pubescens**

1. Smeathmannia laevigata Sol. ex R.Br., Trans. Linn. Soc. London 13: 221 (1821); Hook., Bot. Mag. 71: t.4194 (1845); Lem., Jard. Fleur. 1: Misc. 70 (1851); Pobég., Essai Fl. Guinée Franç. 298 (1906); Stapf in Johnston, Liberia 2: 606 (1906); Hutch. & Dalziel, Fl. W. Trop. Afr. ed. 1, 1(1): 171 (1927); Keay in Hutch. & Dalziel, Fl. W. Trop. Afr. ed. 2, 1(1): 200 (1954). – *Paropsia laevigata* (Sol. ex R.Br.) Warb. in Engl. & Prantl, Nat. Pflanzenfam. 3(6a): 27 (1895). – Type: Sierra Leone, *Smeathman* s.n. (holo BM!). **Figs 1B, 4.**

Smeathmannia laevigata var. *nigerica* A.Chev., Explor. Bot. Afrique Occ. Franç. 285 (1920); Hutch. & Dalziel, Fl. W. Trop. Afr. ed. 1, 1(1): 171 (1927); Keay in Hutch. & Dalziel, Fl. W. Trop. Afr. ed. 2, 1(1): 200 (1954). – Type: Mali, Sangorola, 22 ii 1899, *Chevalier* 345 (lecto P!, designated here, see notes; isolecto BR!), **syn. nov.**

Shrubs, less often treelets. *Branches* with glands near petiole base that are usually sessile (i.e. gland ± as high as wide); flowering and fruiting usually on lower side of branches. *Leaf blade* elliptic to obovate, to c.12 cm long, usually to 9 cm long and decurrent onto the petiole; margin entire to serrate to dentate, usually shallowly so; apex acuminate. *Floral bracts* 2–4, persistent. *Flowers* to c.3.5 cm in diameter, white to cream in vivo, exposed parts of outermost tepals often golden green and inner tepals often light reddish in sicco. *Corona* rather thin, glabrous to very sparsely ciliate. *Filaments* glabrous or pubescent at base. *Pistil* glabrous or sparsely pubescent on lower half of ovary. *Fruit* 1.5–2 times as long as the perianth, ± glabrous.

Distribution and ecology. From the Gambia and Senegal to Liberia, also in SW Mali and NE Côte d'Ivoire (Fig. 4); in coastal savannah, gallery forest, primary or secondary rainforest, often in swampy areas or along streams up to 360 m altitude.

Selected specimens examined. Côte d'Ivoire. **Odienné**: Savanna near Odienne, Barrage of Logohasso, 9°31′N, 7°35′W, 19 x 1974, *J. de Koning* 4158 (WAG).

Gambia. **Basse**: Sutukoba, 13°30′N, 15°50′W, *T. Whitfield* 1846 (BM).

Guinea. **Boké**: Dans les lieux aquatique près du Rio-Nunez, 10°55′N, 14°30′W, 1837, *J. Heudelot* 655 (K, MO, P, WAG). **Kindia**: Friguiagbé, 9°58.80′N, 12°54.00′W, 3 iii 1937, *J. Chillou* 58 (COI, K); Foulayah, 10°05′N, 12°50′W, 16 iii 1993, *L. Aké Assi* 18814 (MO); Road de la frontiere de Senegal a Kindia (gangan) Bafing, Timbis, 9 iv 1956, *J.G. Adam* 11822b (MO). **Pita**: Timbi – Madina, 11°12′N, 12°32′W, 9 iv 1956, *J.G. Adam* 11822 (MO). **Kankan**: Kouroussa, 10°39′N, 9°53′W, *C.H.O. Pobéguin* (Guinea series) 222 (K).

Guinea-Bissau. Bubaque, 11°17′N, 15°51′W, 19 ii 1963, *J. Alves Pereira* 3727 (C); Bubaque, Ancamone, 11°28′N, 16°00′W, 23 i 1961, *A.R.F. Raimundo & J.A. Guerra* 963 (C); Bissau, between Tór and Bijimita, 11°53.50′N, 15°41.00′W, 29 iii 1945, *J.V.G. do P. Espirito Santo* 1897 (COI, K, WAG); Bissau, Brene, 11°53′N, 15°39′W, 1 ii 1945, *J.V.G. do P. Espirito Santo* 1724 (COI, WAG); Gabu, 12°17′N, 14°17′W, iii 1933, *J.V.G. do P. Espirito Santo* 489 (COI); Bedanda, 11°22′N, 15°07′W, 12 i 1962, *J. Alves Pereira* 2762 (C).

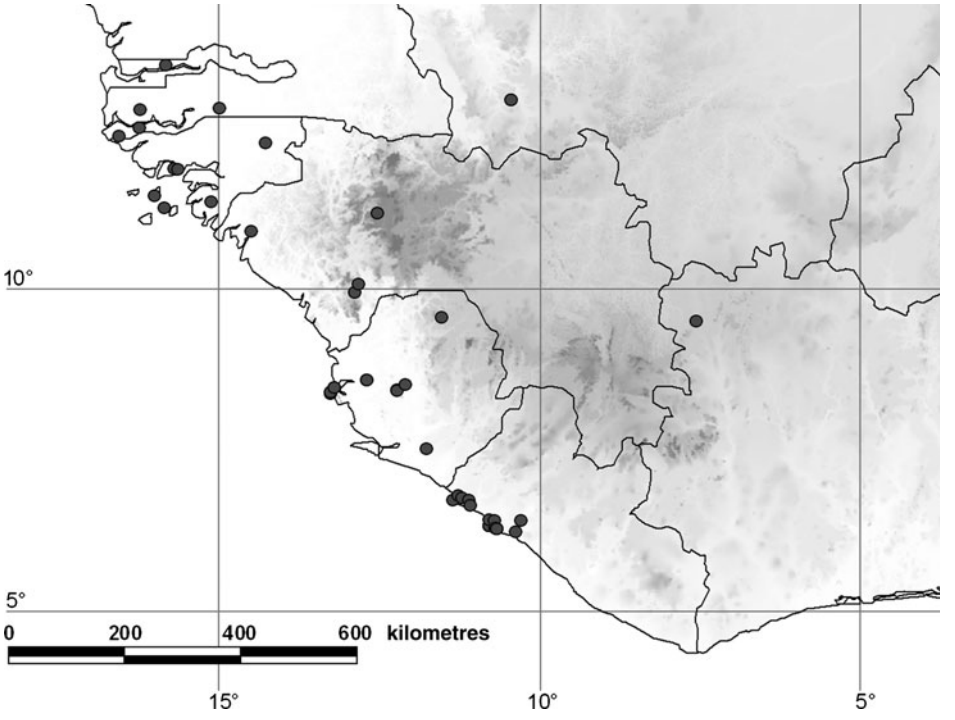

FIG. 4. Distribution map of *Smeathmannia laevigata* Sol. ex R.Br.

LIBERIA. **Grand Cape Mount**: Bendu, 10 miles N of Robertsport, low forest on border of lagoon, 6°46′N, 11°13′W, 30 i 1970, *J.W.A. Jansen* 1768 (WAG); about 5 miles east of Robertsport in hilly country, 6°43′N, 11°21′W, 12 i 1978, *A. de Gier & W. Goll* 131 (WAG); Near intersection of Mano River Road and Robertsport Road, 6°43′N, 11°06′W, 12 i 1978, *A. de Gier & W. Goll* 147 (WAG); north of Lake Piso, 6°48.17′N, 11°17.27′W, 20 m, 20 vii 2004, *C.C.H. Jongkind et al.* 6036 (WAG); Fombah, 6°39′N, 11°05′W, 30 xii 1947, *J.T. Baldwin jr.* 10957 (MO). **Montserrado**: Monrovia, 6°19′N, 10°48′W, 1 xii 1961, *G. Kunkel* 226 (WAG); 'Devil Bush', about 15 km E of Monrovia, between Paynesville and Duport, 6°16′N, 10°40′W, 21 iii 1962, *J.J.F.E. de Wilde & A.G. Voorhoeve* 3621 (WAG); Near Monrovia, 6°19′N, 10°48′W, 1 xii 1961, *G. Kunkel* 245 (WAG); Duport, about 8 miles E of Monrovia, former Porroh bush, 6°16′N, 10°40′W, 21 x 1966, *J.J. Bos* 2296 (BR, WAG); About 10 miles S of Monrovia, Division 33, near school, sec. vegetation, 6°24′N, 10°18′W, 13 v 1971, *J.W.A. Jansen* 2333 (WAG); Savanna area, about 10 miles N of Monrovia, 6°24′N, 10°43′W, 19 ii 1969, *J.W.A. Jansen* 1596 (WAG); Duport, 8 miles E of Monrovia, former Porrobush, 6°16′N, 10°40′W, 30 iii 1966, *J.J. Bos* 1851 (BR, K, WAG); Duport, 8 miles E of Monrovia, former Porrobush, 6°16′N, 10°40′W, 23 iv 1966, *J.J. Bos* 1886 (BR, K, P, WAG); Arboretum Paynesville, 5 miles E of Monrovia, 6°17′N, 10°41′W, 10 m, 23 x 1960, *A.G. Voorhoeve* 89 (WAG); Near Paynesville on coastal savanna, 6°17′N, 10°41′W, 31 viii 1965, *P.P.C. van Meer* 164 (WAG); Brewerville, 6°25′N, 10°47′W, 28 ix 1950, *W.J. Harley* 1661 (WAG); Monrovia, 6°19′N, 10°48′W, 1 xii 1961, *G. Kunkel* 225 (WAG); Monrovia, 6°19′N, 10°48′W, 16 viii 1962, *G. Kunkel* 511 (WAG); Monrovia, 6°19′N, 10°48′W, 20 ii 1962, *G. Kunkel* 499 (WAG); Road to Cooper's Beach, 6°15′N, 10°22′W, 24 v 1970, *F.S.C. Stoop - v.d. Kasteele* 166 (WAG).

MALI. Kayes: Cercle de Bafoulabé, Arrondissement de Bamafélé, 25.3 km S of Manantali, 12°58.54′N, 10°26.79′W, 280–320 m, 17 xi 1999, *C.S. Duvall* 388 (MO); c.2 km NW of old Solo, at seepage area along base of sandstone cliff, in seasonal drainage channel, 12°58.54′N, 10°26.79′W, 340–360 m, 12 vi 2003, *C.S. Duvall* 402 (MO).

SENEGAL. Bignona, 12°49′N, 16°13′W, 22 v 1957, *J.G. Adam* 13546 (MO); Kolda, 12°50′N, 15°00′W, 1827, *G.S. Perrottet* 345 (BM); Ziguinchor, Bayottes, 12°32′N, 16°15′W, 25 v 1957, *J.G. Adam* 13658 (MO); Parc National de la Basse Casamance, 12°24′N, 16°33′W, 26 xi 1984, *P.R.J. Bamps* 7787 (MO, WAG).

SIERRA LEONE. Heddle's farm and Regent, 10 xii 1891, *G.F. Scott Elliot* 3912 (BM); Sangasange, Benna, Scarcies river, 3 i 1892, *G.F. Scott Elliot* 4414 (BM); 1914, *N.W. Thomas* 4022 (K); 1794, *A. Afzelius* s.n. (BM, C); 1912, *J.M. Dalziel* s.n. (MO); Koinadugu, Kabala N.P., 9°35′N, 11°33′W, 10 iv 1968, *E.A. Cole* 165 (K, WAG); Yonibana, 8°26.41′N, 12°14.42′W, 30 x 1914, *N.W. Thomas* 4079 (BM); Magbile, 8°36′N, 12°42′W, 30 m, 6 xii 1915, *N.W. Thomas* 6237 (BM); Kumrabai, 8°32′N, 12°06′W, 15 m, 31 xii 1914, *N.W. Thomas* 4098 (K); Yele, 8°26′N, 12°14′W, 11 xi 1914, *N.W. Thomas* 5064 (K); Yonibana, 8°36′N, 12°42′W, 12 xi 1914, *N.W. Thomas* 4849 (C); Jala, 7°32.01′N, 11°45.43′W, 8 i 1914, *R.H. Bunting* s.n.? (BM); Fourah Bay college, Freetown, 8°29.29′N, 13°12.49′W, 29 vi 1965, *J.K. Morton & A.S. Jarr* SL2052 (WAG); near Laka, Peninsular, By stream between Milton Margai Training College and Lakka, 8°24′N, 13°16′W, 25 ii 1964, *J.K. Morton & A.S. Jarr* SL891a (WAG); Hamilton, Peninsular, 8°23′N, 13°16′W, 5 ii 1964, *J.K. Morton & A.S. Jarr* SL741 (WAG); Freetown, Kortright, Fourah Bay college and Havelock on compound, 8°29.29′N, 13°12.49′W, 9 xi 1963, *J.K. Morton* SL106 (WAG).

The variety *Smeathmannia laevigata* var. *nigerica* A.Chev. was validly published in the original publication (Chevalier, 1920). Therefore, the author citation A.Chev. ex Hutch. & Dalziel in the second edition of the *Flora of West Tropical Africa* is incorrect. In the original publication four collections are mentioned: *Chevalier* 345, 568, 2999 and 15713. From these, *Chevalier* 345 from P is chosen as the lectotype because it is the most complete material. As the variety was described with a combination of leaf characters of *Smeathmannia laevigata* and *S. pubescens*, Keay (1954) suggested a hybrid origin for this variety. However, after having studied many collections, we conclude that the variation in leaf shape, in both *Smeathmannia laevigata* and *S. pubescens*, is such that no discrete entities below species level can be based on these characters.

Smeathmannia laevigata was based on material collected by *Smeathman*, *Afzelius* and *Purdie*. From these the *Smeathman* collection is chosen as the lectotype because it is the most complete material.

2. Smeathmannia pubescens Sol. ex R.Br., Trans. Linn. Soc. London 13: 221 (1821); Hook., Bot. Mag. 74: t.4364 (1848); Lem., Jard. Fleur. 1: Misc. 70 (1851); Stapf in Johnston, Liberia 2: 606 (1906); F.Irvine, Pl. Gold Coast 385 (1930); Aubrév., Fl. Forest. Côte d'Ivoire 3: 29, t.254 (1936); ibid. ed. 2, 3: 38, t.266 (1959); F.Irvine, Woody Pl. Ghana 86 (1961). – *Paropsia pubescens* (Sol. ex R.Br.) Warb. in Engl. & Prantl, Nat. Pflanzenfam. 3(6a): 27 (1895). – Type: Sierra Leone, *Smeathman* s.n. (lecto BM!, designated here, see notes). **Figs 1A, 5.**

Smeathmannia media Sol. ex R.Br., Trans. Linn. Soc. London 13: 221 (1821); Lem., Jard. Fleur. 1: Misc. 70 (1851). – Type: Sierra Leone, *Smeathman* s.n. (holo BM, n.v.).

Smeathmannia rosea Lem., Jard. Fleur. 1: Misc. 71 (1851). – Type: Sierra Leone (no material traced, see notes).

Smeathmannia emarginata Lem., Jard. Fleur. 1: Misc. 71 (1851). – Type: Sierra Leone (no material traced, see notes).

Smeathmannia pubescens var. *cordifolia* A.Chev., Explor. Bot. Afrique Occ. Franç. 285 (1920). – Type: Côte d'Ivoire, Vallée de l'Agniéby, a Voguié, 21 i 1907, *Chevalier* 17132 (holo P!).

Smeathmannia pubescens var. *parvifolia* A.Chev., Explor. Bot. Afrique Occ. Franç. 285 (1920), nomen nudum.

Buelowia illustris Schumach. & Thonn., Beskr. Guin. Pl. 247 (1827). – *Smeathmannia illustris* (Schumach. & Thonn.) Endl. ex Walp., Repert. Bot. Syst. 2: 218 (1843); Lem., Jard. Fleur. 1: Misc. 70 (1851). – Type: Ghana, *Thonning* 85 (holo C†); Mouth of Ancoba River in view of the sea, 4°54.12′N, 2°16.12′W, 27 ii 1995, *C.C.H. Jongkind & D.K. Abbiw* 2064 (neo WAG!, designated here, see notes; isoneo MO!).

Buelowia insignis Schumach. & Thonn. in Hook., Niger Fl. 364 (1849), nomen nudum; Lem., Jard. Fleur. 1: Misc. 70, 71 (1851).

Shrubs or treelets, rarely trees. *Branches* with glands near petiole base that are usually stalked (i.e. gland > 2 times higher than wide); flowering and fruiting usually on upper side of branches. *Leaf blade* elliptic to round to obovate, to c.30 cm long, usually to c.12 cm long; margin serrate to dentate or shallowly so; apex acuminate to acute, less often round. *Floral bracts* usually 2, persistent. *Flowers* to c.6 cm in diameter, white to cream or rarely light reddish in vivo; exposed parts of outer tepals often rather dark brown and inner tepals often medium orange-brown in sicco. *Corona* rather firm at base, pubescent. *Filaments* pubescent at base. *Pistil* densely pubescent on ovary, extending to the styles. *Fruit* as large as the persistent perianth or slightly shorter, pubescent.

Distribution and ecology. Frequently encountered from Guinea-Bissau to SW Ghana, rather rare from Benin to Cameroon (Fig. 5); in coastal savannah, forest edges, secondary rainforest, or occasionally in primary rainforest; usually at low altitudes, occasionally to 770 m.

Selected specimens examined. Benin. Ouémé: Sèmè-Kpodji, Goho (Kétonou), 6°26′N, 2°34′E, 15 m, 10 vii 2001, *A. Akoègninou* 4958 (BENIN).

Cameroon. **Central Province**: 50 km S of Badjob, SW of Eséka, along the Nyong river, near the large bridge, 3°28′N, 10°30′E, 29 i 1964, *W.J.J.O. de Wilde & B.E.E. de Wilde-Duyfjes* 1742 (BR, P, WAG, YA). **Littoral Province**: 70 km SSW of Bafia, left bank of Sanaga river stream upwards from bridge called Kikot (on Douala-Bafia road), 4°11′N, 11°02′E, 3 i 1970, *R. Letouzey* 9808 (WAG). **South Province**: Bipinde, Rainforest, 3°05′N, 10°25′E, 1902, *G.A. Zenker* 2450 (BM, COI, MO, WAG).

Cote d'Ivoire. **Abidjan**: In region of Dabou, 22 v 1969, *M.T. Thijssen* 53 (WAG); 10 km south east of Dabou, direction lagune, 5°18′N, 4°21′W, 21 v 1969, *C. Versteegh & R.W. den*

Outer 92 (MO, U, WAG); Along Agnéby R., 30 km new road Abidjan-Ndouci, 5°30′N, 4°15′W, 29 v 1979, *A.P.M. de Kruif* 111 (WAG); near the ferry from Grand Bassam to Bingerville, 5°12′N, 3°44′W, 1 m, 28 v 1969, *C. Versteegh & R.W. den Outer* 153 (MO, U, WAG); Border of the lagoon Adiopodoumé, 5°20′N, 4°09′W, 9 viii 1956, *J.J.F.E. de Wilde* 194 (WAG); Adiopodoumé, 5°20′N, 4°09′W, 24 vii 1967, *C. Geerling & J. Bokdam* 347 (WAG); Fôret d'I.D.E.R.T., c.17 km West of Abidjan, 5°20′N, 4°08′W, 2 vii 1963, *W.J.J.O. de Wilde* 366 (WAG); In region of Dabou, 5°18′N, 4°21′W, 9 ix 1969, *M.T. Thijssen* 367 (WAG); bank of Comoé River, opposite Grand Bassam, 5°14′N, 3°43′W, 15 vii 1963, *W.J.J.O. de Wilde* 477 (WAG); 200 m N of Anna, lagoon border, along road, 5°19′N, 3°52′W, 5 m, 23 vi 1975, *H.J. Beentje* 524 (WAG); 4 km NNW of Jaqueville, near lagoon Ebrié, 5°13′N, 4°26′W, 5 m, 4 viii 1975, *H.J. Beentje* 663 (WAG); E of Dabou, 5°20′N, 4°22′W, 30 viii 1967, *C. Geerling & J. Bokdam* 795 (WAG); Adiopodoumé, 5°20′N, 4°09′W, 17 vii 1968, *G. Cremers* 871 (MO); Forêt de l'Abouabou, between Abidjan and Grand Bassam, 5°17′N, 3°54′W, 2 m, 12 ii 1959, *A.J.M. Leeuwenberg* 2698 (WAG); Banco Forest Reserve, in Western central part, older secondary forest, 5°23′N, 4°04′W, 21 xi 1973, *J. de Koning* 2767 (WAG); Adiopodoume, secondary forest, 5°21′N, 4°08′W, 27 viii 1974, *J. de Koning* 3880 (WAG); near Adiopodoumé, 17 km W of Abidjan, 5°20′N, 4°08′W, 0–40 m, 17 v 1962, *A.J.M. Leeuwenberg* 4189 (MO, WAG); Forêt d'Audouin, Lagune d'Adupodododoumé, 5°16′N, 4°11′W, 24 viii 1955, *H.C.D. de Wit* 5679 (WAG); Songon - Alari - Layo, near Adiopodoumé, 5°20′N, 4°07′W, 20 viii 1955, *H.C.D. de Wit* 5680 (WAG); Abouabou, 5°17′N, 3°55′W, 16 x 1949, *J.G. Adam* 6546 (MO); Banco Forest Reserve, in the South part of the forest, on humid place, 5°22′N, 4°03′W, 26 iv 1976, *J. de Koning* 6815 (WAG); In vicinioribus ORSTOM, id est loci Adiopoudoumé nuncupati, 5°20′N, 4°09′W, 24 ii 1962, *L. Bernardi* 8258 (MO, WAG); Banco Forest Reserve, 5°23′N, 4°03′W, 26 vi 1975, *W.J. van der Burg* 625a (WAG). **Aboisso**: Botanical reserve Nganda-Nganda, 5 km S of Adiaké, savanna-primary forest, sandy soil, 5°12′N, 3°26′W, 30 m, 25 iv 1970, *J. de Koning* 386 (WAG). **Bouaflé**: Parc National de la Marahoué, 7°00.54′N, 5°57.53′W, 17 viii 2000, *J. Assi Yapo* 413 (WAG). **Grand-Lahou**: About 500 m before the ferry-boat to Grand-Lahou, 5°10′N, 4°59′W, 3 viii 1978, *A.J.F.M. Dekker* 110 (WAG); Riverbank, right bank of R. Bandama, near N'Zida 5°14.0′N, 4°57.0′W, 5 m, 30 vii 1975, *H.J. Beentje* 650 (WAG). **Korhogo**: 50 km SE of Korhogo, at river Bandama-Blanc, 9°13′N, 5°25′W, 17 vii 1969, *C. Versteegh & R.W. den Outer* 540 (WAG). **Odienné**: Odienné,

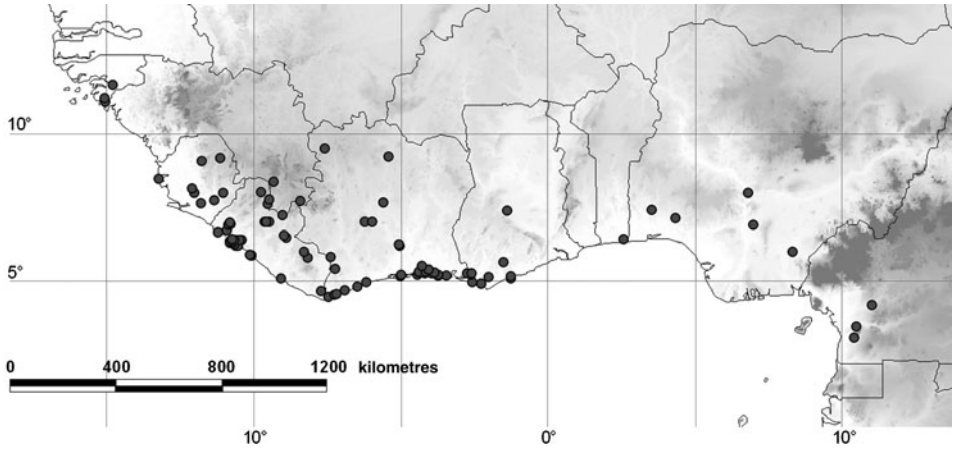

FIG. 5. Distribution map of *Smeathmannia pubescens* Sol. ex R.Br.

9°30′N, 7°34′W, 10 x 1943, *J.G. Adam* 27086 (MO, WAG). **San Pedro**: Savanne de Néro-Mer, c.6 km E and 5 km inland of Bérébу, 4°41′N, 6°55′W, 7 xi 1963, *R.A.A. Oldeman* 531 (WAG); From Tabou 30 km to Bereby, along the road, 4°34′N, 7°10′W, 11 x 1973, *J. de Koning* 2378 (WAG). **Sassandra**: Victorie, 4°49′N, 6°26′W, 2 iv 1968, *C. Geerling & J. Bokdam* 2435 (MO, WAG); In regions of Sassandra, 4°58′N, 6°10′W, 2 vii 1969, *M.T. Thijssen* 114 (WAG). **Tabou**: Along the road from Olodio to Clodio, 4°43.8′N, 7°29.1′W, 7 iv 2000, *C.C.H. Jongkind & J. Assi Yapo* 4962 (WAG); about 15 km E of Tabou along road to San Pedro, 4°31′N, 7°15′W, 11 vii 1978, *A.J.F.M. Dekker* 92 (WAG); About 6 km W of Yaka, about 15 km NW of Tabou, 4°28′N, 7°26′W, 30 viii 1975, *W.J. van der Burg* 814 (WAG); Lamto, 6°13.50′N, 5°01.00′W, 12 vii 1968, *M. Dugerdil* 414 (WAG); Tai, 5°50′N, 7°21′W, 8 xii 1987, *A. de Rouw* 432 (WAG); W part of Marahoue National Park, just east from western border, 6°59.2′N, 6°10.9′W, 18 v 1999, *C.C.H. Jongkind & H. Diomaudé* 4607 (WAG); Lamto Station, 6°15′N, 5°03′W, 12 vii 1968, *F.J. Breteler* 5268 (BR, C, K, L, MO, P, WAG); Beoumi, 7°40′N, 5°34′W, xii 1922, *W.P. Lowe* s.n. (BM).

Ghana. **Ashanti**: Ejura, 7°23′N, 1°22′W, vi 1930, *C. Vigne* 2036 (BM, MO); 'Vineba', 5°10′N, 1°15′W, 1787, *A.P. Hove* s.n. (BM). **Central Region**: Foso, Bimpong Forest Reserve, 5°39′N, 1°30′W, 15 ii 1972, *A.A. Enti* SP577 (MO). **Western Region**: Near Marupong (?), Cape Coast Dist., vii 1921, *W.C. Fishlock* 38 (BM); along the Takoradi-Elubo highway, between 7–30 km east of Elubo, 5°15.4′N, 2°44.3′W, iii 1996, *M.C. Merello et al.* 1451 (MO); Atuabo, 4°58′N, 2°33′W, 16 x 1978, *A.A. Enti* FE1892 (MO, WAG); Axim, near mouth of Ancobra River, 4°54′N, 2°16′W, iv 1952, *J.K. Morton* GC6578 (WAG); Ankasa Forest Reserve, 5°13′N, 2°38′W, 6 x 1973, *A.A. Enti & P.K. Awnah* R1146 (MO); Ankana Forest Reserve, Aiyenase, 5°17′N, 2°35′W, xi 1972, *A.A. Enti* R896 (MO); Tarkwa district, Neung Forest Reserve, 5°07′N, 2°02′W, 7 i 1972, *A.A. Enti* SP504 (WAG); c.1781, *Brass* s.n. (BM).

Guinea. Macenta: Seredou, 8°23′N, 9°18′W, 7 iv 1949, *J.G. Adam* 4261 (MO); Nzérékoré: between Mifergui camp and Zougué, 7°41.8′N, 8°23.7′W, 770 m, 18 vi 2007, *C.C.H. Jongkind et al.* 7730 (WAG).

Guinea-Bissau. **Bafatá**: Cacine, 11°07′N, 15°01′W, ix 1933, *J.V.G. do P. Espirito Santo* 166 (COI); Between Saltinho and Chitole, 11°41′N, 14°46′W, *J.V.G. do P. Espirito Santo* 3825 (BR, COI, MO, WAG). **Tombali**: Estrata do Cantanhez, a 3 km, do entroncamento com a estrada de Quiledje, 11°13′N, 15°03′W, 3 iv 1954, *J.D. D'Orey* 362 (COI).

Liberia. **Bong**: Gbarnga, 3 miles NE of Suacoco, 6°60.50′N, 9°34.00′W, 12 viii 1950, *L.C. Okeke* 8 (COI, MO); Gbarnga district, Suakoko, Cen. Exp. Sta., 6°60′N, 9°35′W, 15 viii 1952, *M.L. Blickenstaff* 74 (COI, MO); 3 miles NE of Suacoco, Gbarnga, Central Province, 6°59′N, 9°28′W, 13 v 1951, *P.V. Konneh* 167 (BM, C, COI, MO). **Grand Bassa**: Buchanan, 5°53′N, 10°03′W, 2 vii 1896, *M.J. Dinklage* 1691 (BM); Buchanan, 5°53′N, 10°03′W, 22 ix 1971, *J.G. Adam* 26078 (MO); Buchanan, 5°53′N, 10°03′W, 24 xi 1974, *J.G. Adam* 29097 (MO); Buchanan, 5°53′N, 10°03′W, 25 ix 1975, *J.G. Adam* 29545 (MO); Buchanan, 5°53′N, 10°03′W, 25 ix 1975, *J.G. Adam* 29568 (MO). **Grand Cape Mount**: Near Bendu, coastal thickets, 6°38′N, 11°11′W, 26 viii 1968, *F.J. Breteler et al.* 5439 (WAG). **Grand Gedeh**: 20 miles from Tchien, along the road to Cap Palmas, High forest, 5°48′N, 8°09′W, 23 vii 1970, *J.W.A. Jansen* 2128 (WAG); Gletown, 5°59′N, 8°15′W, 30 vii 1947, *J.T. Baldwin jr.* 6914 (MO). **Lofa**: Zorzor area, 7°47′N, 9°26′W, 5 iii 1969, *C. Woelfel* 27 (WAG); Zorzor, S of town, on the road to Gbarnga (Banga), near rivercrossing, 7°36′N, 9°29′W, 26 vii 1966, *J.J. Bos* 2135 (K, WAG); North Lorma National Forest, 8°02′N, 9°44′W, 20 xi 2005, *C.C.H. Jongkind et al.* 6738 (WAG). **Maryland**: 20 miles N of Harper, along sec. road, 4°39′N, 7°41′W, 22 vii 1971, *J.W.A. Jansen* 2497 (WAG). **Montserrado**: 1 mile east of Kle, 6°42′N, 10°53′W, 7 x 1972, *J.D. Lemckert* 4 (WAG); Division 16, Firestone Plantations, Harbel, 6°24′N, 10°26′W, 11 ix 1965, *J. Kokulo* 6 (WAG); Vicinity of Firestone Plantations along Dubwai River, Monrovia, 6°23′N, 10°22′W, 1 x 1928, *G.P. Cooper* 51 (BM); Along road from

Robertsfield to Monrovia, near coast, 6°13′N, 10°35′W, 10 viii 1969, *F.S.C. Stoop - v.d. Kasteele* 53 (WAG); Bifurcation Bomi Hills - 'Small Bopolu' and Bomi Hills - Yoma, along the road, 6°56′N, 10°45′W, 24 vii 1965, *P.P.C. van Meer* 69 (WAG); New University Site, Careysburgh, 35 km from Monrovia, 6°24′N, 10°34′W, 13 ix 1963, *A.M. van Harten* 82 (WAG); Near Paynesville on coastal savanna, 6°17′N, 10°41′W, 31 viii 1965, *P.P.C. van Meer* 163 (WAG); Bomi Hills, 6°54′N, 10°49′W, 1969, *F.S.C. Stoop - v.d. Kasteele* 183 (WAG); Arboretum Paynesville, 6°17′N, 10°41′W, 29 iv 1961, *A.G. Voorhoeve* 267 (WAG); Devilbush, Paynesville, 6°17′N, 10°41′W, vii 1961, *A.G. Voorhoeve* 361 (WAG); Devilbush, 6°16′N, 10°40′W, viii 1961, *A.G. Voorhoeve* 385 (WAG); Ganta University Plantation, lateritic soil, 6°26′N, 10°42′W, 50 m, 8 v 1970, *J. de Koning* 418 (WAG); Monrovia, Dukwai River, 6°18.38′N, 10°48.17′W, 17 v 1929, *G.P. Cooper* 442 (BM); New Site, 18 miles from Monrovia, near nursery of University, 6°24′N, 10°39′W, 10 viii 1968, *J.W.A. Jansen* 938 (WAG); Savanna area, about 16 km N of Monrovia, 6°24′N, 10°43′W, 19 ii 1969, *J.W.A. Jansen* 1593 (WAG); Camp Shefflin, 20 miles E of Monrovia along road Monrovia to Roberts International Airport, coastal savanna, 6°13′N, 10°32′W, 11 viii 1969, *J.W.A. Jansen* 1667 (WAG); Duport, 8 miles E of Monrovia, former Porrobush, 6°16′N, 10°40′W, 23 iv 1966, *J.J. Bos* 1879 (BR, K, P, WAG); Mano road NW of Bomi Hills, on the outskirts of the Gola forest, 6°58′N, 10°47′W, 21 vii 1966, *J.J. Bos* 2076 (WAG); Monrovia, 6°19′N, 10°48′W, 4 iii 1975, *W.H. Lewis* 7982 (MO); near Monrovia, 6°19′N, 10°48′W, 1 xi 1947, *J.T. Baldwin jr.* 9200 (MO); c.20 miles east of Monrovia, 6°14′N, 10°30′W, 22 ii 1948, *J.T. Baldwin jr.* 11089 (MO); Monrovia, 6°19′N, 10°48′W, 24 viii 1949, *J.T. Baldwin jr.* 13059 (MO); Begwai, 5°55′N, 10°05′W, 1910, *R.H. Bunting* s.n. (BM). **Nimba**: 2 miles S of Tapita, along road, 6°28′N, 8°50′W, 18 vii 1968, *J.W.A. Jansen* 880 (WAG); Sanokwele district, Ganta, 7°12′N, 8°59′W, 15 xi 1947, *J.T. Baldwin jr.* 9271 (MO). **Sino**: Road from Greenville to African Fruit Company, 5°06′N, 9°04′W, 27 vii 1977, *A. de Gier & W. Goll* 8 (WAG).

Nigeria. **Cross River State**: Obubra District, Iyamoyong Forest Reserve, 5°58′N, 8°21′E, 28 iv 1959, *A. Binuyo* FHI41277 (WAG). **Enugu State**: Nsukka district, Ngurugu, near Anambia River, 6°54′N, 7°00′E, 4 viii 1966, *J.C. Okafor* FHI60364 (MO). **Kogi State**: Kabba Province, Kotokerifi District, on the way to Adanjere in the high forest, 8°00′N, 6°50′E, 10 ix 1958, *B.O. Daramola & J.K. Adebusuyi* FHI38410 (WAG). **Ogun State**: Ijebu District, Sunmoge, Shasha Forest Reserve, 7°08′N, 4°20′E, 5 iv 1935, *R. Ross & G.C. Evans* 221 (BM, MO). **Oyo State**: Abeokuta Province, Olokemeji Forest Reserve, banks of the Ogun, 7°25′N, 3°32′E, xi 1945, *A.P.D. Jones et al.* FHI14522 (BM, MO).

Sierra Leone. 1782, *W. Brass* s.n. (BM); 1792, *A. Afzelius* s.n. (BM). **Eastern Province**: Gberia, Iotombu(?), 8°00′N, 11°00′W, 25 ix 1951, *D. Small* 282 (MO); near Bambavo in Kambui Hills, 7°44′N, 11°18′W, 4 viii 1966, *J.K. Morton & A.S. Jarr* SL3758 (WAG). **Northern Province**: Buntrina (=Bumbuna?), 9°03′N, 11°44′W, 20 x 1914, *N.W. Thomas* 3826 (C); Mt Loma, 9°10′N, 11°07′W, 20 i 1966, *J.G. Adam* 23211 (MO). **Southern Province**: Njala, 8°07′N, 12°05′W, 21 ix 1926, *F.C. Deighton* 74 (BM); 7°38′N, 11°47′W, 1891, *G.F. Scott Elliot* 4387b (BM). **Western Area**: Leicester, above Freetown, 8°28′N, 13°13′W, 28 iii 1958, *F.N. Hepper* 2480 (MO).

In the protologue of *Smeathmannia pubescens* Brown (1821) cites two collections from Sierra Leone: *Smeathman* and *Afzelius*, both without number, collected for Banks. One sheet from BM bears both an *Afzelius* and *Smeathman* collection (as well as a collection from *Hove*, who also collected for Banks, but only in Ghana (Hepper & Neate, 1971)). This is most likely the material that Solander and Brown have studied. The *Smeathman* and *Afzelius* collections are the syntypes of *Smeathmannia pubescens*. From these the *Smeathman* collection is chosen as the lectotype

because it is the most complete material. The specimen *Brass* s.n. (BM!) incorrectly bears a note 'TYPE' as Brass collected only in Ghana (Hepper & Neate, 1971).

The names *Smeathmannia emarginata* Lem. and *S. rosea* Lem. were published by Lemaire (1851), when he worked in Belgium. They are based on material 'of very poor quality', collected in Sierra Leone for 'Belgian horticulturists', probably in 1844 (Lemaire, 1851). Lemaire's herbarium was scattered when he sold it before he moved to Paris where he died in poverty (Stafleu & Cowan, 1979). No material could be traced.

Buelowia illustris Schumach. & Thonn. was described by Schumacher (as *Bülowia illustris*) based on the notes that Thonning made on the collection *Thonning* 85 (in C); the name was published in 1827. The bombardment of Copenhagen by the British in 1807 destroyed most of Thonning's collection, probably including number 85, which caused Thonning to give up on botany altogether. Schumacher published Thonning's notes, but did not cite a specimen, nor a precise type locality for *Buelowia illustris*. Therefore, designation of a neotype is necessary. The collection *Jongkind* 2064 (WAG) is chosen because it fits the description in the protologue, it is complete material, and it has been collected in an area occupied by the Danish around the time that Thonning collected in Ghana.

Acknowledgements

Hans de Vries is kindly acknowledged for his skilful preparation of the drawings, Miguel Leal and an anonymous reviewer helped with the Latin diagnosis, and Julien Bachelier assisted in formatting the figures. The first author thanks Marc Sosef for his helpful comments on an early version of the manuscript as well as his advice during various stages of the revision. We are grateful to the herbaria BM, BR, C, COI, K, LBV, LISC, MO and P for sending specimens on loan. We thank the reviewers for their constructive comments.

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Received 20 March 2008; accepted for publication 25 July 2008